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10/060,544	01/30/2002	Naoki Nishi	09792909-5333	8888

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EXAMINER	
JELINEK, BRIAN J	
ART UNIT	**PAPER NUMBER**
2615	

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/060,544	NISHI, NAOKI	
	Examiner	Art Unit	
	Brian Jelinek	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-24 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 30 January 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This is a first office action in response to application no. 10/060,544 filed on 1/30/2002 in which claims 1-24 are presented for examination.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, and 13-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuji (JP Pub. No. 10-191168).

Please note that Fuji (JP Pub. No. 10-191168) is a foreign application on which Ishigami et al. (U.S. Pat. No. 6,452,634) relies. Consequently, this Office Action references Ishigami et al. as a translation of Fuji.

Regarding claim 1, Ishigami et al. discloses a CCD imaging device (Fig. 9) comprising: a plurality of photodetecting portions that are arranged two-dimensionally (Fig. 9, element 2); a plurality of vertical CCD registers for transferring, in a vertical direction, signal charges that are output from the respective photodetecting portions

(Fig. 9, element 4); and a single horizontal CCD register for transferring, in a horizontal transfer direction, signal charges that have been transferred by the vertical CCD registers (Fig. 9, element 5), the horizontal CCD register having horizontal transfer electrodes in such a manner that four transfer electrodes that are provided so as to correspond to each of the vertical CCD registers (Fig. 10, see "Portion corresponding to photosensor series", 7W comprising electrodes 7s and 7t, 7X comprising electrodes 7s and 7t) are independent of each other electrically because they are insulted from each other by an insulating film (Fig. 10, element 12).

Regarding claim 2, Ishigami et al. discloses the four transfer electrodes that are independent of each other electrically are divided into two pairs of transfer electrodes (Fig. 10, elements 7W and 7X), and wherein each pair of transfer electrodes are driven in phase (Fig. 11, ϕH1a and ϕH2a; please note that the driving signals, ϕH1a vs. ϕH1b and ϕH2a vs. ϕH2b, are completely out of phase; driving signals ϕH1a with ϕH2a are in phase because they share the same signal level at all recurring times T1 and T3) in a state that they are given a prescribed voltage difference in such a manner that the potential becomes deeper in the horizontal transfer direction (Fig. 10, inherent in the process of transferring charge out of the horizontal register).

Regarding claim 3, Ishigami et al. discloses 4n transfer electrodes (Fig. 10, element 7, comprising four 7s electrodes and four 7t electrodes) of the horizontal CCD register that correspond to each set of n vertical CCD registers (Fig. 10, see "Portion corresponding to photosensor series" and note that element 7 designates two

photosensor portions) adjacent to each other can be driven independently of each other electrically (Fig 11, drive signals ϕH1a, ϕH1b, ϕH2a, and ϕH2b), where n is equal to 2.

Regarding claim 4, Ishigami et al. discloses in a state that the four transfer electrodes that are independent of each other electrically are given prescribed voltage differences in such a manner that the potential becomes deeper in the horizontal transfer direction, a set of four transfer electrodes (Fig. 10, 7W and 7X) corresponding to each vertical CCD register are driven in phase (Fig. 11, ϕH1a, ϕH2a) and two sets of four transfer electrodes (Set 1: 7W and 7X; Set 2: 7Y and 7Z) corresponding to each pair of vertical CCD registers adjacent to each other are driven in opposite phases (ϕH1a vs. ϕH1b and ϕH2a vs. ϕH2b), whereby signal charges that have been transferred by each pair of vertical CCD registers adjacent to each other are mixed with each other (Fig. 10, T3).

Regarding claim 5, Ishigami et al. discloses signal charges that have been transferred by each set of n vertical CCD registers adjacent to each other are mixed with each other (Fig. 10, T3) by driving the horizontal CCD register in 4n phases, because each of the four drive signals (ϕH1a, ϕH1b, ϕH2a, and ϕH2b) drives two electrodes for a total of eight electrode driving phases.

Regarding claim 6, Ishigami et al. discloses in a state that each pair of transfer electrodes adjacent to each other (Set 1: 7W and 7X; Set 2: 7Y and 7Z) are supplied with the same voltage or given a prescribed voltage difference in such a manner that the potential becomes deeper in the horizontal transfer direction, the horizontal CCD register is driven in 2n phases, whereby signal charges that have been transferred by

each set of n vertical CCD registers adjacent to each other are mixed with each other by driving the horizontal CCD register in 2n phases because the four drive signals (ϕH1a, ϕH1b, ϕH2a, and ϕH2b) comprise four electrode pair driving phases.

Regarding claim 13, Ishigami et al. discloses a driving method of a CCD imaging device (Fig. 9) comprising a plurality of photodetecting portions that are arranged two-dimensionally (Fig. 9, element 2), a plurality of vertical CCD registers for transferring, in a vertical direction, signal charges that are output from the respective photodetecting portions (Fig. 9, element 4), and a single horizontal CCD register for transferring, in a horizontal transfer direction, signal charges that have been transferred by the vertical CCD registers (Fig. 9, element 5), wherein: the horizontal CCD register has horizontal transfer electrodes in such a manner that four transfer electrodes that are provided so as to correspond to each of the vertical CCD registers (Fig. 10, see "Portion corresponding to photosensor series", 7W comprising electrodes 7s and 7t, 7X comprising electrodes 7s and 7t) are independent of each other electrically because they are insulted from each other by an insulating film (Fig. 10, element 12); and the four transfer electrodes are driven by independent drive pulse signals (Fig. 11, ϕH1a and ϕH2a).

Regarding claim 14, please see the rejection of claim 2.

Regarding claim 15, please see the rejection of claim 3.

Regarding claim 16, please see the rejection of claim 4.

Regarding claim 17, please see the rejection of claim 5.

Regarding claim 18, please see the rejection of claim 6.

Claims 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Murayama et al. (U.S. Pat. No. 4,750,042).

Regarding claim 7, Murayama et al. discloses a CCD imaging device (Fig. 1, element 1) comprising: a plurality of photodetecting portions that are arranged two-dimensionally (Fig. 1, element 1); a plurality of vertical CCD registers for transferring, in a vertical direction, signal charges that are output from the respective photodetecting portions (Fig. 1, element 2); and m horizontal CCD registers for transferring, in a horizontal transfer direction, signal charges that have been transferred by the vertical CCD registers (Fig. 1, elements 6 and 7), the m horizontal CCD registers having horizontal transfer electrodes (Fig. 3) in such a manner that all of transfer electrodes that are provided so as to correspond to each of the vertical CCD registers are independent of each other electrically (col. 2, lines 48-53; Fig. 3, the electrodes 10.sub.1 through 10.sub.n are shown as independent; Fig. 3, channel isolation region 13).

Regarding claim 8, Murayama et al. discloses the transfer electrodes that are independent of each other electrically are divided into pairs of transfer electrodes (e.g, 10.sub.3 and 11.sub.3), and wherein each pair of transfer electrodes are drive in phase in a state (Abstract: lines 8-10) that they are given a prescribed voltage difference in such a manner that the potential becomes deeper in the horizontal transfer direction (col. 2, lines 48-53).

Regarding claim 9, Murayama et al. discloses the transfer electrodes of the m horizontal CCD registers (Fig. 3, elements 10 and 11) that correspond to each set of n vertical CCD registers adjacent to each other (col. 2, lines 48-50) can be driven independently of each other electrically (col. 2, lines 44-46), where n is greater than or equal to 2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 10-12, and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murayama et al. (U.S. Pat. No. 4,750,042) in view of Fuji (JP Pub. No. 10-191168).

Please note that Fuji (JP Pub. No. 10-191168) is a foreign application on which Ishigami et al. (U.S. Pat. No. 6,452,634) relies. Consequently, this Office Action references Ishigami et al. as a translation of Fuji.

Regarding claim 10, Murayama et al. discloses in a state that the transfer electrodes that are independent of each other electrically are given prescribed voltage differences in such a manner that the potential becomes deeper in the horizontal transfer direction, a set of transfer electrodes corresponding to each vertical CCD register are driven in phase (col. 2, lines 35-53; Abstract: lines 8-10). Furthermore,

Murayama et al. discloses the horizontal CCDs may be driven by any driving system with two, three, or four phases (col. 4, lines 16-23).

Murayama et al. does not disclose two sets of transfer electrodes corresponding to each pair of vertical CCD registers adjacent to each other are driven in opposite phases, whereby signal charges that have been transferred by each pair of vertical CCD registers adjacent to each other are mixed with each other.

However, Ishigami et al. discloses in a state that the four transfer electrodes that are independent of each other electrically are given prescribed voltage differences in such a manner that the potential becomes deeper in the horizontal transfer direction, a set of four transfer electrodes (Fig. 10, 7W and 7X) corresponding to each vertical CCD register are driven in phase (Fig. 11, ϕH1a, ϕH2a) and two sets of four transfer electrodes (Set 1: 7W and 7X; Set 2: 7Y and 7Z) corresponding to each pair of vertical CCD registers adjacent to each other are driven in opposite phases (ϕH1a vs. vH1b and ϕH2a vs. ϕH2b), whereby signal charges that have been transferred by each pair of vertical CCD registers adjacent to each other are mixed with each other (Fig. 10, T3). One of ordinary skill in the art would have provided the driving method of Ishigami et al. in order to enable readout of charge from the horizontal CCDs in both a normal speed and an N-speed drive (col. 8, lines 44-65). As a result, it would have been obvious to one of ordinary skill in the art at the time of the invention to provided the driving system of Ishigami et al. in order to enable readout of charge from the horizontal CCDs in both a normal speed and an N-speed drive.

Regarding claim 11, Murayama at al. discloses transferring signal charges of each set of n vertical CCD registers. Murayama et al. does not disclose signal charges that have been transferred by each set of n vertical CCD registers adjacent to each other are mixed with each other by driving the m horizontal CCD registers in a prescribed number of phases, the prescribed number being equal to the number of transfer electrodes of the m horizontal CCD registers corresponding to the n vertical CCD registers.

TTQ
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However, Ishigami et al. ~~discloses~~ discloses signal charges that have been transferred by each set of n vertical CCD registers adjacent to each other are mixed with each other (Fig. 10, T3) by driving the horizontal CCD register in 4n phases, because each of the four drive signals (ϕH1a, ϕH1b, ϕH2a, and ϕH2b) drives two electrodes for a total of eight electrode driving phases. One of ordinary skill in the art would have provided the driving method of Ishigami et al. in order to enable readout of charge from the horizontal CCDs in both a normal speed and an N-speed drive (col. 8, lines 44-65). As a result; it would have been obvious to one of ordinary skill in the art at the time of the invention to provided the driving system of Ishigami et al. in order to enable readout of charge from the horizontal CCD in both a normal speed and an N-speed drive.

Regarding claim 12, please see the rejection of claim 6. One of ordinary skill in the art would have provided the driving method of Ishigami et al. in order to enable readout of charge from the horizontal CCDs in both a normal speed and an N-speed drive (col. 8, lines 44-65). As a result, it would have been obvious to one of ordinary

skill in the art at the time of the invention to provided the driving system of Ishigami et al. in order to enable readout of charge from the horizontal CCD in both a normal speed and an N-speed drive.

Regarding claim 19, Murayama et al. discloses a driving method of a CCD imaging device comprising a plurality of photodetecting portions (Fig. 1, element 1) that are arranged two-dimensionally (Fig. 1, element 1), a plurality of vertical CCD registers for transferring, in a vertical direction, signal charges that are output from the respective photodetecting portions (Fig. 1, element 2), and m horizontal CCD registers for transferring, in a horizontal transfer direction, signal charges that have been transferred by the vertical CCD registers (Fig. 1, elements 6 and 7), wherein: the m horizontal CCD registers have horizontal transfer electrodes (Fig. 3, elements 10 and 11) in such a manner that all of transfer electrodes that are provided so as to correspond to each of the vertical CCD registers are independent of each other electrically (col. 2, lines 48-53; Fig. 3, the electrodes 10.sub.1 through 10.sub.n are shown as independent; Fig. 3, channel isolation region 13); and the transfer electrodes corresponding to each of the vertical CCD registers are driven by independent drive pulse signals (col. 2, lines 44-46). One of ordinary skill in the art would have provided the driving method of Ishigami et al. in order to enable readout of charge from the horizontal CCDs in both a normal speed and an N-speed drive (col. 8, lines 44-65). As a result, it would have been obvious to one of ordinary skill in the art at the time of the invention to provided the driving system of Ishigami et al. in order to enable readout of charge from the horizontal CCDs in both a normal speed and an N-speed drive.

Regarding claim 20, please see the rejection of claim 14.

Regarding claim 21, please see the rejection of claim 15.

Regarding claim 22, please see the rejection of claim 16.

Regarding claim 23, please see the rejection of claim 11.

Regarding claim 24, please see the rejection of claim 12.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Jelinek whose telephone number is (703) 305-4724 until 3/2/2005, and (571)272-7366 thereafter. The examiner can normally be reached on M-F 8:00 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Thai Tran can be reached at (703) 305-4725. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).